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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,184	11/20/2003	Jeffrey R. Lehtinen	2802-359-056	9317

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EXAMINER
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KIM, TAE JUN

ART UNIT	PAPER NUMBER
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3746

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/718,184

Applicant(s)

LEHTINEN, JEFFREY R.

Examiner

Ted Kim

Art Unit

3746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above; the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/20/2003</u> . | 6) <input type="checkbox"/> Other: ____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 19, line 12 recites the limitation "said *external* [sic, internal] combustion engine". There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-15, 19-24 are rejected under 35 U.S.C. 102() as being anticipated by Romey (4,835,971). Romey teaches In a fuel injector assembly, for dispensing fuel in the combustion chamber of a gas turbine engine, having a contoured outer housing 42, attached on one end to an engine casing, fully enveloping a contoured flexible fuel feed 14, fixedly attached at one end thereof to a housing inlet and having a nozzle assembly 24 operatively connected therewith at another end, attached at a housing outlet end 42, said fuel feed being otherwise separated from said housing by a peripheral insulating space, wherein the improvement comprises: a. said housing outlet end having a first contoured surface portion 42; and b. said nozzle assembly including a movable nozzle spray-tip 24

having a second contoured surface portion 40 in complementary mating engagement with said housing first contoured surface portion 41, 42, resulting in sliding relative motion therebetween upon the operation of said gas turbine engine, and inherently capable of accommodating the thermal expansion differential arising due to the differing temperatures of said housing and said fuel feed; wherein said first and second are contoured surface portions are interior and exterior contoured surfaces, respectively or vice versa; wherein said first and second contoured surface portions are exterior and interior surfaces, respectively, or vice versa, and are curved/spherical; said housing outlet end further includes a shroud, with said shroud including said first contoured surface portion including a curved/spherical portion; said housing outlet end further includes an adaptor member 16, 48, interposed between said housing outlet end and said shroud, said adaptor member including a further contoured surface portion near 48; said nozzle spray-tip exterior surface portion is in complementary mating engagement with both of said first and further contoured surface portions (see Fig. 1); said first and further contoured surface portions are also axially movable relative to each other (see col. 4, lines 30-34).

A fuel injector assembly, for dispensing fuel in the combustion chamber of a gas turbine engine, having a shaped outer housing, attached at one end to an engine casing, fully enveloping a shaped flexible fuel feed line 14, affixed at one end thereof to a housing inlet and having a nozzle assembly 24 operatively connected therewith at another end, affixed to a housing outlet end via a shroud 42 and an intermediate adaptor member 16,

48, said fuel feed line 14 being otherwise separated from said housing by a surrounding insulating, space, wherein the improvement comprises: a. said shroud 42 and said adaptor member 16 both including spaced first 41 and second contoured surface portions 48, respectively; and b. said nozzle assembly including a movable, elastically deformable (inherent), nozzle spray-tip 24, having a third contoured surface portion 40 mating with both said first and second contoured surface portions, resulting in pivotal relative motion therebetween upon the operation of said gas turbine engine, and is inherently able to accommodate the thermal expansion differential arising from the differing temperatures of said housing and said fuel feed line. An improved fuel injector assembly, for use in an internal combustion engine, including a curved outer housing, fixedly retained on one end at an engine casing, fully enclosing a curved flexible fuel feed member 14, said flexible feed member being affixed at an outer end to a housing inlet end and having a nozzle assembly operatively connected therewith at an inner end thereof, said nozzle assembly being yieldingly attached at a housing outlet end, said fuel feed member being otherwise spaced from said housing via a peripheral insulating space, said improvement comprising: a. said housing outlet end including at least one shaped surface portion; and b. said nozzle assembly including a movable nozzle spray-tip 24 having another shaped surface portion 40 complementarily matingly conforming with and being in contact with said at least one shaped surface portion 41, resulting in relative motion therebetween upon the operation of said external combustion engine, which is inherently able to

accommodate the thermal expansion differential arising due to the differing temperatures of said housing and said fuel feed member.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

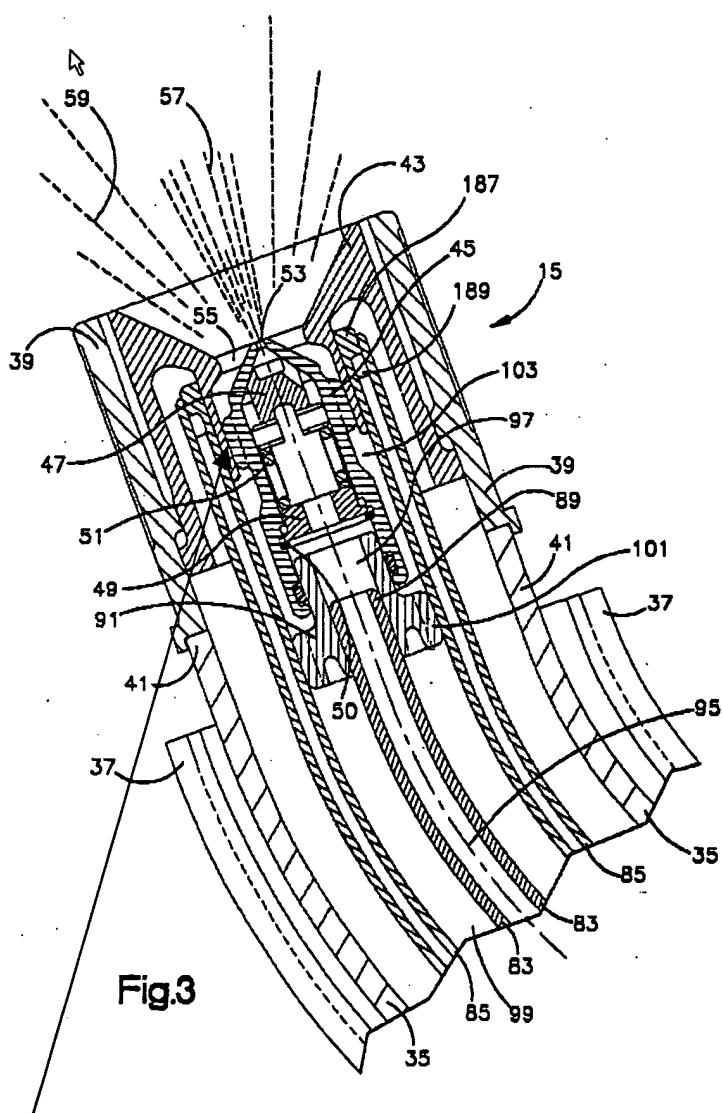
6. Claims 1-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Romey et al in view of either Ben-Porat (4,454,711) or Pidcock et al (4,693,074). Romey et al teach various aspects of the claimed invention but do not teach the adapter member of the housing 16, 48 has a curved surface. Ben-Porat teach a spherical surface (right portion of 50) is used to match the spherical surface of the rotating nozzle 44 and handle thermal expansion. Pidcock et al teach (Figs. 12-14) that a spherical surface surrounding on 92, 94 which surround 90 (Fig. 12) is used, and show that a spherical surface on 100 surrounding 96 (Fig. 14) is used to allow pivoting and/or axial movement to accommodate thermal expansion. It would have been obvious to one of ordinary skill in the art to employ a spherical surface for the adapter member to accommodate the thermal expansion and/or axial and/or pivoting movement encountered by Romey et al.

7. Claims 1-15, 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Richey et al (4,735,044) in view of Romey et al and Pidcock et al (4,693,074). Richey et

al teach a fuel injector assembly, for dispensing fuel in the combustion chamber of a gas turbine engine, having a contoured outer housing 21, attached on one end to an engine casing, fully enveloping a contoured flexible fuel feed 30, fixedly attached at one end thereof to a housing inlet and having a nozzle assembly operatively connected therewith at another end, attached at a housing outlet end 78 (see Fig. 6), said fuel feed being otherwise separated from said housing by a peripheral insulating space. Richey et al do not teach the relative movement between the fuel nozzle and the shroud. Romey et al is cited as a teaching reference to show that it is old and well known in the art to employ relative movement between the fuel nozzle and the shroud. Pidcock et al teach one of ordinary skill in the art Figs. 12-14) that a spherical surface surrounding on 92, 94 which surround 90 (Fig. 12) is used, and show that a spherical surface on 100 surrounding 96 (Fig. 14) is used to allow pivoting and/or axial movement to accommodate thermal expansion. It would have been obvious to one of ordinary skill in the art to employ a spherical joint, as shown in any of Figs. 12-14, to accommodate pivoting and/or axial movement to accommodate thermal expansion between the nozzle and housing shroud of Richey et al. Note that Pidcock et al also teach an adapter member 92 in conjunction with the shroud 94 (Fig. 12). It would have been obvious to one of ordinary skill in the art to employ a further adapter member to facilitate the thermal expansion.

8. Claims 1-15, 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mains (5,570,580) in view of Romey et al and Pidcock et al (4,693,074). Mains teaches a fuel injector assembly, for dispensing fuel in the combustion chamber of a gas turbine

engine, having a contoured outer housing, attached on one end to an engine casing, fully enveloping a contoured flexible fuel feed 83, fixedly attached at one end thereof to a housing inlet and having a nozzle assembly 45 operatively connected therewith at another end, attached at a housing outlet end, 187 and 39 together, said fuel feed being otherwise separated from said housing by a peripheral insulating space,



adjacent contoured surfaces (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> depending on which claim)



Mains does not teach each contoured surface is curved nor the pivotal or axial movement at the mating of the contoured surfaces. Romey et al is cited as a teaching reference to show that it is old and well known in the art to employ relative movement between the fuel nozzle and the shroud. Pidcock et al teach one of ordinary skill in the art Figs. 12-14) that a spherical surface surrounding on 92, 94 which surround 90 (Fig. 12) is used, and show that a spherical surface on 100 surrounding 96 (Fig. 14) is used to allow pivoting and/or axial movement to accommodate thermal expansion. It would have been obvious to one of ordinary skill in the art to employ a spherical joint, as shown in any of Figs. 12-14, to accommodate pivoting and/or axial movement to accommodate thermal expansion between the nozzle and housing shroud of Richey et al. Note that Pidcock et al also teach an adapter member 92 in conjunction with the shroud 94 (Fig. 12). It would have been obvious to one of ordinary skill in the art to employ a further adapter member to facilitate the thermal expansion.

### ***Contact Information***


Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Ted Kim whose telephone number is 571-272-4829. The Examiner can be reached on regular business hours before 5:00 pm, Monday to Thursday and every other Friday.

The fax numbers for the organization where this application is assigned are 571-273-8300 for Regular faxes and 571-273-8300 for After Final faxes.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Thorpe, can be reached at 571-272-4444.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist of Technology Center 3700, whose telephone number is 703-308-0861. General inquiries can also be directed to the Patents Assistance Center whose telephone number is 800-786-9199. Furthermore, a variety of online resources are available at <http://www.uspto.gov/main/patents.htm>

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Ted Kim  
Primary Examiner  
August 5, 2005

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